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TITLE: Method of producing light reflector made of  
polybutylene terephthalate  
resin - by molding a resin composition to form a molded part,  
and forming a  
direct light reflecting metal layer on at least part of the  
molded part

PATENT-ASSIGNEE: POLYPLASTICS KK[POPL]

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ABSTRACTED-PUB-NO: JP2000035509A

BASIC-ABSTRACT: NOVELTY - The production of a light reflector  
made of a  
polybutylene terephthalate resin comprises: (a) molding a  
resin composition to  
form a molded part; (b) forming a direct light reflecting  
metal layer on at  
least part of the molded part.

DETAILED DESCRIPTION - The resin composition is formed by  
blending (a) a  
polybutylene terephthalate resin, 100 parts by weight, having

a terminated  
carboxyl group, 50 meq/kg or less with (b) a polyethylene  
terephthalate resin,  
5-80 parts by weight; and (c) a nonfibrous inorganic filler,  
2-50 parts by  
weight, having a mean primary particle diameter of 10  
micronmeters or less.

USE - The method produces the light reflector used in a  
reflector, or an  
extension for an automobile lamp.

ADVANTAGE - The molded part has very high brightness, less  
decrease in  
brightness caused by cloud even if the molded part is made by  
continuous  
molding, and exposed at high temperatures, and superior  
adhesion to metals, and  
heat resistance.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS:

METHOD PRODUCE LIGHT REFLECT MADE POLYBUTYLENE TEREPHTHALATE  
RESIN RESIN  
COMPOSITION FORM PART FORMING DIRECT LIGHT REFLECT METAL  
LAYER PART PART

DERWENT-CLASS: A23 A89 P73 P81

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A12-T04A;

ENHANCED-POLYMER-INDEXING:

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D10 D19

D18 D31 D50 D63 D92 E21 E00

Polymer Index [1.2]

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Polymer Index [1.3]

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Q9234 Q9212 ; Q9999 Q9289 Q9212 ; B9999 B4682 B4568 ;  
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018 ; D00 ; G3190 R01541 D00 F80 O\* 6A Mg 2A Si 4A G3010  
Al 3A ;  
R01949 D00 F80 O\* 6A Al 3A Si 4A ; A999 A237 ; A999 A771  
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DETAILED DESCRIPTION

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[Detailed description]

[0001]

[The technical field to which invention belongs] this invention relates to the light-reflex field acquired by the manufacture technique of the light-reflex field made from polybutyrene terephthalate resin, and this technique. Since [ still detailed / that the surface gloss of mold goods is very high and ] there are few amounts of gassings, it not only has high mirror-plane nature and a feeling of quantity brightness, but it is related with the surface [ it is possible to form a direct light-reflex metal layer, without making under coats, such as a under coat, mold goods, and ] appearance nature maintenance (thermal resistance) at the time of elevated-temperature use, and the manufacture technique of the light-reflex field made from polybutyrene terephthalate resin of having excelled also in the adhesion with a metal The light-reflex field made from a resin of this invention is used suitable for an automobile, a construction device, and the lamp \*\*\*\* parts in the field of many industry. It is used suitable for a reflector, an extension, etc. which are the lamp circumference parts of the automobile which needs the rate of a high feeling [ of surface brightness ], smooth nature, and high light reflex especially.

[0002]

[A Prior art and Object of the Invention] The high feeling of brightness, smooth nature, a uniform reflection factor, high thermal resistance, etc. are required for reflectors, such as the light-reflex field, especially an extension of lamp \*\*\*\* of an automobile, because of the directivity of the lamp light source, and reflex nature. Therefore, conventionally, after excelling in a mechanical property, an electrical property, in addition physical / chemical property at a reflector, and using the material which carried out addition combination of various reinforcements for the mixture with the crystalline thermoplasticity polyester resin with good workability especially a polybutyrene-terephthalate-resin independent, or a polyethylene-terephthalate resin and performing pretreatments (under coat), such as a under coat, to the mold goods, the light-reflex field made into the purpose has been acquired by forming a light-reflex metal layer by technique, such as vacuum deposition. However, since under coats, such as a under coat, serve as a steep cost rise, to acquire the light-reflex field which has a high feeling of brightness also in under-coat loess is desired. In order for the reflector to which the light-reflex layer was given by the whole surface of mold goods at least in under-coat loess to have a feeling of high brightness, and a uniform reflection factor, it needs for the resin mold goods itself to have good surface smooth nature, and to have high glossiness and feeling of brightness. Moreover, the thermal resistance of the intended-use specification to a resin is also an important problem. general -- polybutyrene terephthalate resin -- the quick crystallization speed sake -- metal mold -- solidification inside is quick and it is difficult to obtain good mirror-plane imprint nature When inorganic fillers, such as talc and a mica, are furthermore added for heat-resistant grant, these fillers loom and \*\* becomes remarkable. then -- the technique in a material side when obtaining the mold goods which have a feeling of a high gloss, and good front-face nature \*\*\*\*\* -- polybutyrene terephthalate resin -- an amorphous polymer -- adding -- the crystallization speed of a material -- lowering -- metal mold -- while imprint nature is raised, the technique of a filler looming and suppressing \*\* is used moreover, the technique and the die temperature which raise resin temperature and raise a fluidity as the technique in a molding side -- raising -- a crystallization speed -- delaying -- metal mold -- generally the method of raising imprint nature etc. is used Although the appearance of mold goods improves by such technique, since elevation of resin temperature and a die temperature makes remarkable the problem of the occurrence gas at the time of molding, it blooms cloudy on a mold-goods front face (Hayes) and the poor appearance of a \*\* is generated, good mold goods cannot be obtained continuously, but, metal mold wipes off and the new cure of a grade is needed. Moreover, when the own thermal resistance of an amorphous polymer of addition of an amorphous polymer is also low, it causes a fall of the front-face nature and the feeling of brightness resulting from an amorphous polymer, and makes the heat-resistant level as light-reflex field fall to the bottom of elevated-temperature use. Moreover, in the amorphous polymer which has a high glass transition temperature, generally the compatibility with polybutyrene terephthalate resin is bad, and good front-face nature is not obtained. Therefore, the development of the light-reflex field with the thermal resistance which has a good feeling of brightness and a high reflection factor and good metal adhesion even if it carries out the vacuum evaporatio of the direct light-reflex metal layer to resin mold goods, without carrying out a under coat, and can maintain these properties also under elevated-temperature use was desired.

[0003]

[The means for solving a technical problem] this invention person etc. inquired zealously in view of the above-mentioned technical problem that the light-reflex field with which the light-reflex field of polybutyrene-terephthalate-resin mold goods which can form a direct light-reflex metal layer in part at least, and was acquired has a good feeling of brightness etc. should be offered. Consequently, the amount of terminal carboxyl groups By using the resin constituent mold goods which added the

polyethylene-terephthalate resin and the specific inorganic bulking agent for 50 meq/kg [ less than ] polybutylene terephthalate resin, it finds out that the metal layer with sufficient adhesion can be formed, and came to complete this invention. That is, this invention is (A). The amount of terminal carboxyl groups 50 meq/kg [ less than ] polybutylene terephthalate resin As opposed to 100 weight section (B) The polyethylene-terephthalate resin 5 - 80 weight section, and (C) The first [ an average of ] particle diameter is 10 micrometers. Fabricate the resin constituent which blended the following un-fibrous inorganic fillers 2 - 50 weight section, and it considers as mold goods. It is the manufacture technique of the light-reflex field made from polybutylene terephthalate resin characterized by the thing of these mold goods for which a direct light-reflex metal layer is formed in part at least.

[0004]

[Gestalt of implementation of invention] Hereafter, the constituent of the resin constituent used for this invention one by one is explained in detail. First, (A) which is the substrate resin of the resin constituent of this invention The amount of terminal carboxyl groups polybutylene terephthalate resin among the polybutylene terephthalates which carry out the polycondensation of the alkylene glycol or its ester formation derivative of a terephthalic acid or its ester formation derivative, and the carbon number 4, and are obtained It is set less than to 50 meq/kg. Moreover, a polybutylene terephthalate may be a copolymer which contains 70 % of the weight or more in itself. As a monomer by which copolymerization is carried out, as dibasic-acid components other than a terephthalic acid and its lower-alcohol ester An isophthalic acid, a naphthalene dicarboxylic acid, an adipic acid, a sebacic acid, Aliphatic series, such as trimellitic acid and a succinic acid, aromatic polybasic acid, or its ester plasticity derivative again as glycol components other than 1 and 4-butanediol A usual alkylene glycol, for example, ethylene glycol, a diethylene glycol, A propylene glycol, a trimethylene glycol, a hexamethylene glycol, Low-grade alkylene glycols [ , such as 1 and 3-octanediol ], such as neopentyl glycol and cyclohexane dimethanol, Aromatic alcohols, such as a bisphenol A, 4, and 4'-dihydroxy biphenyl, Alkylene oxide adduct alcohol, such as a two mols adduct of ethyleneoxides of bisphenol A, and a three mols adduct of propylene oxides of bisphenol A, A polyhydroxy compound or its ester plasticity derivatives, such as a glycerol and a pentaerythritol, etc. are mentioned. For the polybutylene terephthalate which uses the above-mentioned \*\*\*\* compound as a monomer component, and is generated according to a polycondensation in this invention, what \*\* is also (A) of this invention. Although it can be used as a component, and it is independent, or two or more kinds are mixed and it is used, a polybutylene terephthalate is used preferably. Moreover, the branched polymer belonging to a copolymer can also be used. A polybutylene-terephthalate branched polymer here is polyester by which makes a subject the so-called polybutylene terephthalate or a butylene terephthalate monomer, and the branching was carried out by adding a polyfunctional nature compound. As a polyfunctional nature compound which can be used here, there are a trimesic acid, trimellitic acid, pyromellitic acid and these alcoholic ester, a glycerol, \*\*\*\*\* roll ethane, a trimethylol propane, a pentaerythritol, etc. the trituration sample of the polybutylene terephthalate by which the polycondensation was carried out from the above-mentioned monomer in this invention -- inside of benzyl alcohol The amount of terminal carboxyl groups which titrated in the sodium-hydroxide aqueous solution of 0.01N after lysis for 10 minutes by 215 degrees C, and was measured 50 meq/less than kg -- desirable -- 40 meq/less than kg -- especially -- desirable -- A 30 meq/kg [ less than ] polybutylene terephthalate is used. The amount of terminal carboxyl groups of such a polybutylene terephthalate If 50 meq/kg is exceeded, Hayes of the mold goods obtained becomes remarkable and it is not desirable.

[0005] Next, in the constituent of this invention, it is (B). A polyethylene-terephthalate resin is added. This (B) A polyethylene-terephthalate resin is (A). It is an indispensable component when raising the mold goods obtained by carrying out addition combination and the surface smooth nature of a light-reflex metal layer, the feeling of brightness, etc. to polybutylene terephthalate resin. as for a polyethylene terephthalate, for a parvus reason, compared with a polybutylene terephthalate, a crystallization speed carries out addition combination of this -- the metal mold as a resin constituent -- it has the effect which raises imprint nature Moreover, when suppressing a fall of the surface smooth nature generated when the light-reflex field sets under elevated temperatures, such as light and heat, or the feeling of brightness, deformation, etc., it has an effect. When obtaining a good light-reflex appearance article from the standpoint of two points above, a polyethylene-terephthalate resin is an indispensable component in this invention. The polyethylene-terephthalate resin used for such the purpose may be a polymer which is made to carry out the polycondensation reaction of the alkylene glycol or its ester formation derivative of a terephthalic acid or its ester formation derivative, and the carbon number 2, and is obtained, and may be a copolymer which contains 70 % of the weight or more for a polyethylene terephthalate. As a monomer by which copolymerization is carried out, as dibasic-acid components other than a terephthalic acid and its lower-alcohol ester Aliphatic series, such as an isophthalic acid, a naphthalene dicarboxylic acid, an adipic acid, a sebacic acid, trimellitic acid, and a succinic acid, aromatic polybasic acid, or its ester plasticity derivative again as glycol components other than ethylene glycol A usual alkylene glycol, for example, a diethylene glycol, a propylene glycol, A trimethylene glycol, a hexamethylene glycol, neopentyl glycol, Low-grade alkylene glycols [ , such as 1 and 3-octanediol ], such as cyclohexane dimethanol, Alkylene oxide adduct alcohol, such as a two mols adduct of ethyleneoxides of bisphenol A, and a three mols adduct of propylene oxides of bisphenol A, A polyhydroxy compound or its ester plasticity derivatives, such as a glycerol and a pentaerythritol, etc. are mentioned. Although the polyethylene-terephthalate resin used by this invention has the preferably useful non-denatured polyethylene terephthalate, the light-reflex field which has the front-face nature also with a good isophthalic-acid denaturation polyethylene-terephthalate copolymer and a feeling of high brightness can be acquired. In this case, it is desirable to use preferably the 5 - 40 mol% polyethylene-terephthalate copolymer by which isophthalic-acid denaturation was carried out. Moreover, the polyethylene terephthalate used for this invention is the influence which it has on a fluidity or an appearance to 0.5-1.0. What has a limiting viscosity (eta) is desirable. moreover, polyethylene terephthalate (B) an addition -- (A) Component 100 the weight section -- receiving -- 5 - 80 weight section -- it is

10 - 40 weight section preferably metal mold good when too little -- since imprint nature is not obtained, the good feeling of brightness made into the purpose of this invention and the light-reflex field which has front-face nature cannot be acquired. Moreover, when excessive, it is not desirable [ the increase in a molding cycle aggravation of a mold-release characteristic, etc. ] in order for the poor appearance originating in occurrence gas to occur and to cause a fall of the feeling of brightness, and front-face nature except that the problem on molding arises.

[0006] Next, it is (C) as an indispensable component when giving the uniform feeling of brightness and uniform thermal resistance in this invention. The first [ an average of ] particle diameter is 10 micrometers. The following un-fibrous inorganic fillers are added. For the un-fibrous inorganic filler used here, the first [ an average of ] particle diameter is 10 micrometers. It is 0.04-10 micrometers preferably hereafter. It is 0.04-5 micrometers especially preferably. It will not be limited especially if it is a thing. It is one sort chosen out of the group which consists of talc, a mica, clay, a kaolin, a wollastonite, a glass bead, glass flakes, and zinc sulfide preferably, or two sorts or more, and is one sort chosen out of the group which consists of talc, a mica, clay, and a kaolin preferably especially, or two sorts or more. the addition of this un-fibrous inorganic filler -- (A) Polybutylene terephthalate 100 weight section -- receiving -- 2 - 50 weight section -- it is 5 - 25 weight section preferably Under 2 weight section is not enough as the addition of an un-fibrous inorganic filler in a heat-resistant field, and it becomes [ from the shortage of rigidity ] easy to generate asymmetry of a front face, a wave, etc. and is not desirable. Moreover, if 50 weight section is exceeded, operation of extrusion etc. will be difficult and a uniform light-reflex front face will be hard to be obtained from an inorganic filler looming in the obtained mold-goods front face, and \*\* becoming remarkable.

[0007] It is (A) as described above. To the polybutylene terephthalate resin of the specific amount of carboxyl groups, it is (B). Addition combination of the polyethylene-terephthalate resin is carried out, and it is (C) further. Since it has the outstanding mold-goods appearance, even if a direct light-reflex metal layer is formed, the feeling of brightness is high and, as for the polybutylene-terephthalate-resin constituent obtained by adding the un-fibrous inorganic filler which has a specific diameter of a primary particle, has a good light-reflex front face.

[0008] Moreover, when the thermal stability at the time of molding of the resin constituent which constitutes the light-reflex field from this invention is raised and it is fabricated especially continuously, it is the meaning which suppresses a fall of the appearance and the feeling of brightness by the influence of the gas which occurs from a resin constituent, a low-molecular component, a stain feature, etc., and it is (D) further. It is desirable to add an antioxidant as a component. (D) used for this invention As an antioxidant of a component It is desirable to consist of one sort or two sorts or more of combination chosen out of a \*\*\*\*\* phenols, thioether, and organic phosphite. these addition When an effect is in the enhancement in a melting thermal stability within the time of extrusion, or a making machine and the surface cloudiness by adhesion of gas obtains continuously the mold goods of few good appearance and front-face nature, while it is useful It is useful, especially when the light-reflex field sets under a high temperature service, generation of gas and the decomposition product which are generated from a resin is suppressed and good appearance and front-face nature are maintained. When the example of the antioxidant used here is shown, as a \*\*\*\*\* phenols Tetrakis {methylene-3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate} methane, A triethylene-glycol-screw {3 - (3-t-butyl-5-methyl-4-hydroxyphenyl) propionate}, There is a 1 and 6-hexandiol-screw {3 - (3, 5-G t-butyl-4-hydroxyphenyl) propionate} etc. As thioether, tetrakis {methylene-3-(dodecyl thio) propionate} methane, There are dimyristyl thiodipropionate, didodecyl thiodipropionate, etc. As organic phosphite, screw (2, t-6-G 4 methylphenyl) pentaerythritoldiphosphite, There are screw (2, 4-G t-buthylphenyl) pentaerythritoldiphosphite, tetrakis (2, 4-G t-buthylphenyl) -4, 4'-biphenylene phosphite, tris (2, 4-G t-buthylphenyl) phosphite, etc. Especially combined use of a \*\*\*\*\* phenols, thioether and a \*\*\*\*\* phenols, organic phosphite, and these three sorts of antioxidants is effective. Moreover, if the phosphoric-acid metal salt is also suitable and an example is shown as a substitute of an organic phosphite antioxidant, the first calcium phosphate and one hydrate of the first sodium phosphate will be mentioned. (D) to use The addition of an antioxidant is (A). Polybutylene terephthalate 100 It is 0.1-3.0 to the weight section. It is the weight section. When too little [ an addition ], it is not desirable from the thermal stabilities of a resin running short and reducing the front-face nature and the feeling of brightness of the poor appearance at the time of molding, occurrence of the surface cloudiness by the gassing, and the light-reflex field under elevated-temperature use, and the gas of the antioxidant (especially end group) origin occurring from the light-reflex field under elevated-temperature use, when excessive, and becoming the cause of the Hayes occurrence.

[0009] Furthermore, at this invention, it is (E). It is desirable to add as a component one sort or two sorts or more of compounds chosen out of glycerine fatty acid esters, sorbitan fatty acid esters, a polyether system compound, fatty-acid metal salts, trimellitic acid ester, and pyromellitic acid ester. These are important when obtaining the mold goods of a good appearance continuously it not only raising the mold-release characteristic of the product at the time of molding, but. That is, addition of these components is extruded, has an effect as an internal lubricant in the case of the melting mixing at the time of molding, and enables it to offer continuously the mold goods of the good appearance with little cloudiness by gas adhesion etc. by suppressing the pitch solution at the time of melting. the glycerine fatty acid esters used for such the purpose, and sorbitan fatty acid esters \*\*\*\*\* -- desirable -- carbon number the monochrome or the \*\* fatty-acid-ester field which consists of C11 (lauric acid)-C28 (montanoic acid) -- it is -- especially -- desirable -- It is the monochrome or \*\* fatty acid ester which consists of C17 (stearin acid)-C21 (behenic acid). These have an effect and do not make a light-reflex body surface generate cloudiness etc. also in prolonged use under an elevated temperature, especially when it oozes out at the time of the light-reflex field being put on the bottom of an elevated temperature and a grade is suppressed. When these concrete targets are shown, they are glycerol monostearate, glycerol monobehenate, glycerine dibehenate, glycerol-12-hydroxy monostearate, sorbitan monochrome behenate, etc. Moreover, as a polyether system compound, the polyethylene glycol, a polyethylene glycol ether and polyethylene glycol esters, etc. are effective. Moreover, as fatty-acid metal salts, the carbon number of the alkyl fraction of a fatty acid From the lauric acid of C11

What consists of stearin acid of C17 is desirable, and the metal salt by zinc, calcium, aluminum, magnesium, barium, etc. is suitable. Moreover, as trimellitic acid ester and pyromellitic acid ester, these octyl ester, alkyl ester, iso nonyl ester, \*\*\*\*\* sill ester, etc. are mentioned. The addition of these compounds is (A). Polybutylene terephthalate 100 It is 0.05-2.0 to the weight section. It is the weight section. When too little [ an addition ], it extrudes, the shearing force to the resin at the time of a fabricating operation increases, it becomes the factor which causes a pitch solution, and it becomes difficult to obtain the product of a good appearance continuously. Moreover, when excessive, Hayes and stain \*\*\*\* may actualize by some service temperature, and it is not desirable.

[0010] In this invention, the thing desirable as technique which manufactures the light-reflex field is technique by which formation of a light-reflex metal layer is performed by forming in a resin mold-goods front face the metal membrane which has a specular gloss with dry plating (PVD). Moreover, they are the vapor rate of 0.5-5nm after it is desirable that dry plating is vacuum deposition and it decompresses preferably  $1 \times 10^{-2}$  or less Pa of initial degree of vacuums to  $2 \times 10^{-3}$  or less Pa / sec. Especially the thing to do for the vacuum evaporatono of the metal is desirable. Moreover, as a metal membrane, aluminum is desirable. furthermore -- the technique of having a feeling of high brightness and obtaining a good light-reflex front face \*\*\*\*\* -- beforehand -- 2.5-3.5Pa argon gas -- a direct current or a RF -- a plasma ---izing -- this argon plasma -- a resin mold-goods front face -- \*\*\*\* -- after carrying out surface-activity-ized processing by things, it is desirable to form a light-reflex metal layer furthermore -- desirable -- after surface-activity-ized processing, oxygen, nitrogen, or those mixture of gases -- \*\*\*\* -- a reactivity monomer after introducing a functional group into a front face by things -- \*\*\*\* -- after introducing an activated-molecule layer or a hydrophilic polymer layer into a front face by things, it is the technique of forming a light-reflex metal layer, and according to the technique of starting, that in which the feeling of brightness has a good high light-reflex front face is obtained

[0011] In order to give a desired property to the constituent of this invention furthermore according to the purpose, the addition combined use of the well-known matter generally added by thermoplastics etc. can be carried out. For example, an antistatic agent and the above (E) Coloring agents, such as mold releasing agents other than a component, a color, and a pigment, etc. can blend all.

[0012] Manufacture of the constituent of this invention is easily prepared by the facility and technique which are generally used as conventional resin constituent method of preparation. For example, (1) Specified quantity batch mixture of the component which constitutes the constituent of this invention is carried out, melting mulling is carried out with the extruder of one shaft or two shafts, and the pellet of the purpose composition is obtained. (2) It is the extruder of one shaft which has two or more raw-material input port, or two shafts, and supply and carry out melting mulling of the inorganic filler from the second raw material input port, and obtain the pellet of the purpose composition, after supplying and carrying out melting mulling of a resin, a stabilizer, the pigment component, etc. from the first input port. As a method of fabricating for filling up metal mold with a resin, although there are an injection-molding method, an injection-stamping method, etc., the injection-molding method is common.

[0013]

[Example] Hereafter, although an example explains this invention concretely, this invention is not limited to these. In addition, the measuring method of the evaluation item shown in the following examples is as follows.

(1) The vacuum platings of aluminium was given on the conditions shown in an example and the example of a comparison using the appearance following mold goods (plate) on the front face of a light reflex. The status of the light-reflex surface appearance of such light-reflex field was observed visually, and the following mark were given.

1; -- it has a high feeling of brightness, a fluorescent lamp is distorted, and it is reflected clearly [ there is nothing and ]

2; -- some [ although it has a high feeling of brightness, a fluorescent lamp is distorted and it is reflected that there is nothing / by gas ] -- blooming cloudy -- it is .

The cloudiness by 3; gas is seen somewhat, and although a fluorescent lamp is distorted and is reflected that there is nothing, it fades somewhat.

4; front face is not uniform, and a fluorescent lamp is distorted somewhat and reflected. Moreover, the cloudiness by gas is also seen.

5; front face is ruined, and a fluorescent lamp is lenticulated and reflected. Moreover, it sees white by gas.

Furthermore, after carrying out heat neglect of the above-mentioned light-reflex field for 140 \*\* / 24 hours, the status of a light-reflex appearance was observed visually similarly, and mark were given similarly.

(Process condition) Using the plate (50mmx50mmx2mm thickness) fabricated on the following conditions, the light-reflex field carries out vacuum evaporatono according to the following vacuum evaporatono conditions, and is acquired. making machine : -- Japanese -- steel 75Tsa Process-condition: A nozzle C1 C2 C3 Cylinder temperature (\*\*) 260 260 240 220 An injection speed 2.0m/min The dwelling force 400 kg/cm2 A die temperature After plasma-izing the argon gas of 95 \*\* vacuum evaporatono condition \*\*:3.0 Pa by the direct current of 500V and processing mold goods for 5 minutes, the inside of vacuum evaporatono equipment is decompressed up to  $1.0 \times 10^{-2}$  Pa, and it is 1.0 nm/sec. Aluminum was deposited to the thickness of 100 nm at the speed.

Vacuum-evaporatono Condition \*\*: It deposited on the same conditions as condition \*\* except not carrying out an argon gassing.

(2) Using the plate (50mmx50mmx2mm thickness) fabricated on the surface smooth nature above-mentioned conditions, the surface-roughness meter (Tokyo Seimitsu Make, surfboard COM 554A) was used, and a ten point average of roughness height (mum) and the maximum height (mum) were measured.

(3) Bending elastic-modulus ASTM It measured according to D-790.

(4) Heat deflection temperature (HDT)

As pretreatment, it is ASTM 190 \*\* and after carrying out an annealing for 1 hour about a test piece. It measured according to D-648 (the weight for measurement used as fiber stress 0.46MPa is used).

[0014] Example 1 (A) By 0.75, the amount (the amount of CEGs) of terminal carboxyl groups Polybutyrene terephthalate resin which is 30 meq/kg As opposed to 100 weight section [ a limiting viscosity (eta) ] (B) A limiting viscosity (eta) adds the polyethylene-terephthalate resin 15 weight section of 0.63. 2-3 micrometers of furthermore, the first [ an average of ] particle diameters Talc (C-1) 10 weight section and tetrakis {methylene-3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate} methane (D-1) 0.6 Weight section, Tetrakis (2, 4-G t-buthylphenyl) -4 and 4'-biphenylene phosphite (D-2) 0.4 Weight section, Glycerol monostearate (E-1) 0.6 By carrying out weight section addition, the obtained resin constituent was used, like the above, mold goods were obtained, the vacuum evaporatio (vacuum evaporatio condition \*\*) of the aluminum was carried out to this like the above, and the light-reflex field was manufactured and evaluated.

It sets in the example 2 - the 3 above-mentioned example 1, and is 7 micrometers of the first [ an average of ] particle diameters. Talc (C-2) And first [ an average of ] particle diameter 1.5 mum Kaolin (C-3) Except having used it, it was similarly estimated as the example 1.

Talc of the example 4 above-mentioned example 1 (C-1) Except having made the addition into 20 weight section, it was similarly estimated as the example 1.

It sets in the example 5 - the 8 above-mentioned example 1, and is glycerol monostearate (E-1). It replaces with and they are a zinc stearate (E-2), polyoxyethylene alkyl ether (the Kao Corp. make, emulgen 709) (E-3), trimellitic acid trioctyl ester (the product made from Large 8 Chemical industries, TOTM) (E-4), and pentaerythritol tetrapod stearate (E-5). Except having used it, it was similarly estimated as the example 1.

The amount of example 9 terminal carboxyl groups Except having used the polybutyrene terephthalate resin which is 15 meq/kg, it was similarly estimated as the example 1.

In the example 10 - the 11 above-mentioned examples 1 and 3, it was similarly estimated as the example 1 except having carried out vacuum evaporatio by vacuum evaporatio condition \*\*.

In the example 12 above-mentioned example 1, it was similarly estimated as the example 1 except having made the addition of a polyethylene-terephthalate resin into 30 weight section.

It sets in the example 13 above-mentioned example 12, and is tetrakis {methylene-3-(dodecyl thio) propionate} methane (D-3) as an antioxidant further. 0.4 Except having carried out weight section addition, it was similarly estimated as the example 12.

The amount of terminal carboxyl groups in the example 14 above-mentioned example 12 Except having used the polybutyrene terephthalate resin which is 15 meq/kg, it was similarly estimated as the example 12. These results are shown in Tables 1-2.

[0015] The amount of terminal carboxyl groups in the example of comparison 1 above-mentioned example 1 Except having used the polybutyrene terephthalate resin which is 60 meq/kg, it was similarly estimated as the example 1.

The polyethylene-terephthalate resin case of example 2 of a comparison and not adding was shown for the case where the addition of a polyethylene-terephthalate resin is made into 85 weight section, as an example 3 of a comparison to the example 2 of a comparison, - the 3 above-mentioned example 1.

It is 40 micrometers of the first particle diameters to the example 4 of a comparison, - the 7 above-mentioned example 1. They are the example 6 of a comparison, and talc (C-1) in the case where talc (C'-1) is used, about talc (C-1) the case of the examples 4 and 5 (the example 4 of a comparison is vacuum evaporatio condition \*\*, and the example 5 of a comparison is vacuum evaporatio condition \*\*) of a comparison, and not adding.

It sets in the example of comparison 8 above-mentioned example 1, and is an antioxidant (D-1) (D-2). Except neither adding, it was similarly estimated as the example 1. These results are shown in Table 3.

[0016]

[Table 1]



		実施例 1	実施例 2	実施例 3	実施例 4	実施例 5	実施例 6	実施例 7	実施例 8
(A) ポリブチレンテレフタレート 被覆部	重量部	100	100	100	100	100	100	100	100
	CEG量	30	30	30	30	30	30	30	30
(B) ポリエチレンテレフタレート 被覆部	重量部	15	15	15	15	15	15	15	15
(C) 非線維状無機充填材 (C-1) タルク (2~3 $\mu\text{m}$ ) (C-2) タルク (7 $\mu\text{m}$ ) (C-3) カオリン (1.5 $\mu\text{m}$ ) (C-4) タルク (40 $\mu\text{m}$ )	重量部	10	10	10	20	10	10	10	10
(D) 酸化防止剤 (D-1) (D-2) (D-3)	重量部	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
(E) 溶剤類 (E-1) (E-2) (E-3) (E-4) (E-5)	重量部	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
製造条件		①	①	①	①	①	①	①	①
光反射体外観	無溶剤後	1	1	1	2	1	1	1	1
	140℃/24h 後	1	2	1	3	1	1	2	4
表面平滑性	十点平均粗さ	$\mu\text{m}$	0.23	0.35	0.22	0.64	0.23	0.25	0.27
	最大高さ	$\mu\text{m}$	0.35	0.43	0.30	0.67	0.33	0.45	0.33
熱安定温度	℃	197	199	193	200	197	197	196	197
曲げ弾性率	MPa	3030	3130	2985	4060	3070	3085	3020	3080

[0017]

[Table 2]

		実施例 9	実施例 10	実施例 11	実施例 12	実施例 13	実施例 14
(A) ポリブチレンテレフタレート 被覆部	重量部	100	100	100	100	100	100
	CEG量	15	30	30	30	30	15
(B) ポリエチレンテレフタレート 被覆部	重量部	15	15	15	30	30	30
(C) 非線維状無機充填材 (C-1) タルク (2~3 $\mu\text{m}$ ) (C-2) タルク (7 $\mu\text{m}$ ) (C-3) カオリン (1.5 $\mu\text{m}$ ) (C-4) タルク (40 $\mu\text{m}$ )	重量部	10	10	10	10	10	10
(D) 酸化防止剤 (D-1) (D-2) (D-3)	重量部	0.6	0.6	0.6	0.6	0.6	0.6
		0.4	0.4	0.4	0.4	0.4	0.4
(E) 溶剤類 (E-1) (E-2) (E-3) (E-4) (E-5)	重量部	0.6	0.6	0.6	0.6	0.6	0.6
製造条件		①	②	②	①	①	①
光反射体外観	無溶剤後	1	1	1	2	1	1
	140℃/24h 後	1	2	2	2	1	1
表面平滑性	十点平均粗さ	$\mu\text{m}$	0.25	0.23	0.22	0.39	0.23
	最大高さ	$\mu\text{m}$	0.32	0.35	0.30	0.51	0.35
熱安定温度	℃	197	197	193	199	199	198
曲げ弾性率	MPa	3030	3030	2985	3145	3150	3100

[0018]

[Table 3]

		比較例 1	比較例 2	比較例 3	比較例 4	比較例 5	比較例 6	比較例 7	比較例 8
(A) ポリブチレンテレフタレート 樹脂	重量部	100	100	100	100	100	100	100	100
	CEG量	60	30	30	30	30	30	30	30
(B) ポリエチレンテレフタレート 樹脂	重量部	15	55		15	15	15	15	15
(C) 有機顔料分散液 C-1) タルク (2~3 μm) C-2) タルク (7 μm) C-3) カオリン (1.5 μm) C-4) タルク (40 μm)	重量部	10	10	10				60	10
					10	10			
(D) 酸化防止剤 D-1) D-2) D-3)	重量部	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
		0.4	0.4	0.4	0.4	0.4	0.4	0.4	
(E) 潤滑剤 E-1) E-2) E-3) E-4) E-5)	重量部	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
成形条件		①	①	①	①	②	①	①	①
光反射率 (%)	直接光	2	3	3	4	4	1	5	3
	140℃/2h 後	4	3	4	5	5	1	5	4
表面平滑性	十点平均粗さ	μm	0.58	0.66	0.75	1.15	1.15	0.10	2.10
	最大高さ	μm	0.71	0.81	0.91	1.30	1.30	0.13	2.40
熱安定性	℃	197	200	195	200	200	175	205	197
曲げ弾性率	MPa	3050	3250	3090	3200	3200	2550	5150	3090

[0019]

[Effect of the invention] The light-reflex field made from polybutyrene terephthalate resin which was described above and which is acquired by this invention like The amount of terminal carboxyl groups To a 50 meq/kg [ less than ] polybutylene terephthalate A polyethylene-terephthalate resin is blended and the first [ an average of ] particle diameter is 10 micrometers further. In part at least by [ of the mold goods which add the following un-fibrous inorganic fillers and are obtained ] forming a direct light-reflex metal layer Even if it has a very high feeling of brightness and it \*\*s under continuous molding and an elevated temperature, there are few feeling falls of brightness by cloudiness, and they are excellent in the adhesion with a metal, and thermal resistance. Such light-reflex field is used suitable for a reflector, an extension, etc. of an automobile lamp which need high reflex nature especially.

[Translation done.]